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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,047	02/02/2004	Kalin Sparious	PD-02W202	1523
7590 John E. Gunther Raytheon Company P.O. Box 902 (E1/E150) El Segundo, CA 90245-0902			EXAMINER NGUYEN, PHILLIP	
			ART UNIT 2828	PAPER NUMBER
			MAIL DATE 08/07/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/771,047

**Applicant(s)**

SPARIOSU ET AL.

**Examiner**

PHILLIP NGUYEN

**Art Unit**

2828

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5-8, 10-13, 16, 17, 20-24, 26-29, 31-40 and 43-58 is/are pending in the application.
- 4a) Of the above claim(s) 10, 11, 13 and 56 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3, 22-24, 26-29, 31-40, 43-51, 54-55 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-8, 16, 17, 20, 21, 52, 53, 57 and 58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 13 and 56 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/3/2008.

However, applicant has failed to provide any arguments why claims 13 and 56 are not elected with traverse. The restriction has now made final.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-2, 5-8, 16-21, 26-29, 31-40, 43-4, have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "said plurality of laser fibers are eye-safe laser fibers" which is not clear because all fibers are eye-safe unless they are physically in contact with eyes. It is believed that the term would make sense as "fiber lasers" instead of "laser fibers".

Claim 52 recites "said plural pump sources" which lacks of antecedent basis.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

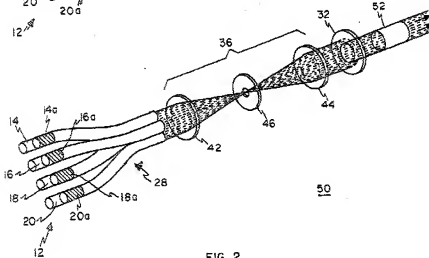
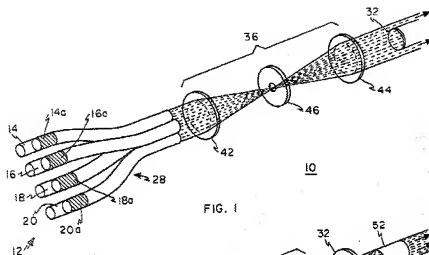
Claim 58 is rejected under 35 U.S.C. 102(b) as being anticipated by Waarts et al. (US 6298187). Waarts discloses in Fig. 1 a laser system comprising a plurality of laser fibers at least some of which have different lengths, the different length laser fibers differing from one another by more than 1.5 cm (col. 11, lines 34-38).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 5-7, 16, 20, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rediker (US 4479224) in view of Hamilton et al. (US 20050018740).



With respect to claims 1 and 20, Rediker discloses in Fig. 1-2 a laser system comprising a plurality of laser fibers 28; a high power pump source 14, 16, 18, 20 coupled to each of said laser fibers; and an external cavity (defined by fiber end and reflector 32) having an optical axis, said external cavity having a first lens 42, a single aperture 46, a second lens 44, and a mirror 362 located at focal points of the first and second lenses. However, Rediker does not disclose beam-flattening optics. Hamilton discloses in Fig. 13-14 a laser system having an external cavity

including beam flattening optics 1309, a first lens 1313, an aperture 1315, a second lens 1317, and a mirror 1305. It would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a beam flattening optics as taught by Hamilton to Rediker in order to collimate light from the laser fibers to prevent loss (paragraph 0038). It is further noted that in the instant application, applicant asserts that beam flattening optics are well known in the art, and one skilled in the art with access to the present teachings may construct the array of beam-flattening optics 20 without undue experimentation (page 13, lines 1-5). Therefore, it is strongly believed that adding beam flattening optics as claimed is neither novel nor inventive.

With respect to claim 2, it is believed that the fiber bundle 28 is eye-safe when not physically contacting eye.

With respect to claim 5, Rediker discloses each of said high power laser pump sources include a laser diode (col. 3, lines 11-13).

With respect to claim 6, Rediker discloses the claimed invention except for discrete imaging optics. In Fig. 4 of the present application, focusing lens 70 is designated as discrete imaging optics. Hamilton further discloses discrete imaging optics 1319 being end-coupled via the laser pump source 1301. It would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a discrete imaging optics as taught by Hamilton to Rediker in order to reduce the divergence (paragraph 0071).

With respect to claim 7, Rediker discloses the pump sources 14, 16, 18, and 20 are coupled via a reflective cavity.

With respect to claim 16, since Rediker discloses the fiber bundle being used as “cavity end”, the ends are considered as integrated reflectors.

With respect to claim 57, since Rediker discloses the product shown in the rejection of claim 13, it is inherent product by process to perform the recited method.

6. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rediker (US 4479224) in view of Hamilton et al. (US 20050018740) and further in view Waarts et al. (US 6298187). Rediker and Hamilton disclose the claimed invention except for the laser fibers with differing lengths differ in length from one another by more than 1.5 centimeters. Waarts discloses fibers with different lengths by at least 1.5 cm. It would have been obvious to one skill in the art at the time the invention was made to provide fibers with different lengths by at least 1.5 cm as taught by Waarts to provide different wavelengths.

7. Claims 16-17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rediker (US 4479224) in view of Hamilton et al. (US 20050018740) and further in view of Jiang et al. (US 6982997).

With respect to claims 16-17, Rediker and Hamilton disclose the claimed invention except for a Bragg reflectors integrated in the laser fiber. Jiang discloses in Fig. 1 Bragg reflectors 14 integrated in the laser fiber 18. It would have been obvious to one skill in the art at the time the invention was made to provide the Bragg reflectors 14 as taught by Jiang in order to provide a feedback necessary to sustain the laser operation in the external cavity (col. 3, ln. 27-31).

With respect to claim 21, Rediker discloses said plural pump sources include diodes (14, 16, 18, and 20).

8. Claims 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rediker (US 4479224) in view of Feillens et al. (US 20030086154).

With respect to claim 52, Rediker discloses in Figs. 1-2 plurality of high power pump sources 14-20 that provide input electromagnetic energy; and laser resonator cores (inside the fiber bundle 28) coupled to "said plural" pump sources 14-20 and arranged to direct receive said input electromagnetic energy and provide laser energy in response thereto except for said laser resonator cores comprising Er:YAG crystal.

Feillens discloses in Fig. 8 laser resonator cores comprising Er:YAG crystal.

It would have been obvious to one skill in the art at the time the invention was made to provide the laser resonator cores with Er:YAG as taught by Feillens to Rediker in order to advantageously use for optical signals over broader bandwidth than the other type of amplifier (see paragraph 0088).

With respect to claim 53, Rediker discloses the laser resonator cores being optically edge coupled.



***Allowable Subject Matter***

9. The following is an examiner's statement of reasons for allowance: Claims 3, 22-24, 26-29, 31-40, 43-51, and 54-55 are allowed.

With respect to claims 3, 22-24, 26-28, and 46-51 the prior art fail to teach or suggest said laser fibers being Er:YAG laser fibers, in combination with the other claimed features. The prior art also fails to teach a diode emitter array for each of said plurality of laser fiber. Rediker teaches using a plurality of laser diode for a plurality of laser fibers.

Claims 29, 31-40, and 43-45 are allowed because the prior art does not teach or suggest the claimed beam phase-locking system comprising multiple fiber laser oscillator having integrated Bragg grating mirrors along with other features. The fiber laser oscillator in claim 29 differs than the laser fiber that is claimed in claim 1 because the laser fiber in claim 1 is simply considered a fiber for guiding laser. Furthermore, claim 29 recites integrated Bragg grating mirrors representing a first end of spatial filter in the second means.

Claims 54-55 are allowed because there is not taught the claimed invention as claimed in claim 52 and a container that accommodates the resonator cores and internally reflecting said input of electromagnetic energy to facilitate coupling of said input electromagnetic energy with said laser resonator cores.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Communication Information***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip Nguyen whose telephone number is 571-272-1947. The examiner can normally be reached on 9:00 AM - 6:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY, can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Supervisory Patent Examiner, Art Unit 2828